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MAYAN LANGUAGES EDUCATION AND TECHNOLOGY: A CASE STUDY OF
KAQCHIKEL AND K'ICHE' EDUCATORS IN GUATEMALA

by

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A THESIS

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MAYAN LANGUAGES EDUCATION AND TECHNOLOGY: A CASE STUDY OF
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University of Nebraska, 2019

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The purpose of this qualitative study was to describe and analyze how Mayan language instructors in the Faculty of Humanities at the Universidad de San Carlos de Guatemala use technology in their classrooms. In this research, indigenous professors shared their experiences as Kaqchikel and K'iche' language instructors at the higher education level. A narrative qualitative case study was applied to discover the practices and insights of two Kaqchikel Mayan language instructor and one K'iche' Mayan language instructor by addressing the following questions: (1) How do the professors use technology while teaching IDI3 Mayan Language in the Faculty of Humanities at the Universidad de San Carlos de Guatemala? (2) In what ways do indigenous language speaker professors describe their experience of teaching their language and culture to Spanish language speaking at the Universidad de San Carlos de Guatemala? (3) In what ways do students engage with the use of technology for the purpose of acquiring language skills in the Mayan language as a third language? The findings showed that teachers know how to use technology and why they don't use it in the classroom. These findings reveal Mayan instructors' experiences and remembrances of teaching Mayan language and culture to undergrad students who are mostly Spanish speakers.

Furthermore, the participants agreed on how students' engagement increased by combining a variety of class activities and technological tools to learn the language.

These results suggest that there would be value in the creation of a variety of workshops of how to use technology in the classroom. This may be possible by providing different professional growth opportunities.

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CHAPTER 1: INTRODUCTION

This study is focused on indigenous language teaching programs and technology. I have been thinking about helping the indigenous language program in Guatemala start to use the technologies of information and communication technology with a specific purpose to take advantage of the new educational policies where indigenous languages are being taught as a third languages for non-indigenous language speakers (after Spanish and English).

In Guatemala, the Mayan groups are considered a minority, and are usually excluded from educational policies even though they constitute a majority of the population. They constitute more than 50% of the population in the country. (Estrada 2012) They are considered minority groups as a consequence of the legacy of Hispanic colonization. In Guatemala, *“a typical Mayan laborer earns less than \$4 a day. Poverty rates in rural Guatemala often exceed 70%”* (Guatemala Literacy 2018).

Historically, educational policies from different administrations excluded Mayans from sharing the benefits of quality of education. As it is mentioned in Guatemala Literacy project (2018), indigenous Guatemalans are still victims of racism, injustice, and exclusion, not only from education opportunities but from labor and land as well. The Ministry of Education in Guatemala is taking small steps to include policies to support the victims of the brutal legacy of the thirty-six years of civil war which left more than 200,000 dead and hundreds of thousands more displaced (Guatemala Literacy 2018). That war disproportionately affected the indigenous population.

There is no education equality in Guatemala, and, among all the ethnic groups living in the country, Mayan groups do not have equal access to educational facilities,

teachers, or books. The inequality is worse for women, who seldom attend school because they stay at home to help their mothers.

I experienced education inequality in my country firsthand when I taught in a rural area in the Western Highlands in Guatemala in 2001. There were 29 second grade students who were sharing a small classroom of approximately 10 x 15 m. There was a lack of bilingual teachers (Maya Language-Spanish), and because I did not know any Maya language, I had to teach students in Spanish. However, the majority of students (90%) spoke Kaqchikel (one of the 22 different Mayan languages in Guatemala) and very little Spanish. Additionally, there were no Mayan language books to teach them. This undoubtedly caused several cognitive problems to the students, because they could not fully understand the lectures, on top of the difficulty of the classes *per se*.

The use of technology in language programs

A general definition of Artificial Intelligence (AI) notes that it is a division of computer science that seeks to produce a method to accomplish actions that are commonly related to human intelligence, such as reasoning and optimization through experience and factual and heuristic knowledge. AI activity includes professional systems, natural language understanding, speech recognition, vision, and robotics. (Rajasingham 2009)

According to an interview with Nick Bostrom (2006) on CNN, AI had shown incremental progress but not yet the great breakthroughs that people were predicting 30 or 40 years ago (CNN.com 2006).

However, Rajasingham (2009) explained that in a few years we will see an exponential growth in the application of artificial intelligence in human activities. Bostrom may have been accurately characterizing where the field was 10+ years ago, but Rajasingham's projection better describes where the AI field now is.

Kavi Murphy (2002), Rajasingham (2009) also anticipated an important role of AI in e-learning. Murphy discusses that the changes in e-learning systems would be based on the integration of e-learning and AI. This would involve using features from human intelligence and applying them as algorithms in a computer-friendly system to suit individual learner styles.

A current study from eSchool News (2019), Smruti Sudarshan (2018) discovered that the use of AI in the education industry will grow by 47.5% through 2021.

Sudarshan adds that the technology's impact will happen to all levels in education to create adaptive learning features with personalized tools to improve learners' experience.

The applicability and possible efficacy of AI modeling techniques in different educational setting such as learning languages can lead to the development of an AI based-literacy program in Mayan languages. This program will contribute to the educational system agenda in Guatemala.

While this is relevant to rural areas where Mayan languages is common, I believe that these new technologies and AI may well benefit the availability of literacy programs in Mayan languages in Guatemala where internal migration patterns have led to there also being substantial Kaqchikel -fluent population.

CHAPTER 2: REVIEW OF LITERATURE

Background Literature

Conceptual framework

My conceptual framework guides the methodological and analytical decisions of this research project. The main topic to be investigated is indigenous languages education that integrates digital technology into the instruction. The educational technology being used in indigenous language programs is intended as an aid tool for teachers. Therefore, students and teachers in the Mayan language acquisition can experience a dynamic language lesson classes with oral tradition, cultural values, and the historical Mayan heritage by using technology; the teachers should be shown evidence of the technology being used in class such as social media, by using computers, tablets, or cellphones. The goal of knowing the technology being used in the classroom is to develop a training program that helps teachers to use new methodologies as part of their professional development and help teachers to know if their students are being engaged, motivated and developed critical thinking by using technology.

Literature Review

Indigenous language education and technology

The literature on the topic of indigenous languages and technology describes five fields. The first field focuses on previous research conducted on indigenous languages and technology, the second field explains technology in education past and present, the third one explored the indigenous people, languages, culture, values, and technology. The

fourth field examined languages which are being taught by using technology. The fifth literature works add to understanding the advantages of using technology and indigenous languages.

Studies have shown that there is an interest of knowing about indigenous languages and technologies. Du (2017) shows the results the results of the analysis of research practiced in English language about indigenous people and information and communications technology (ICT) by assessing studies from 1995-2013. Du notes the negative effects of ICT on indigenous people and their communities from the existing language bias of the digital technology, but also the high cost of internet access, isolation, and inadequate telecommunications infrastructure. So, for several reasons there is a reluctant of some indigenous communities to use technology.

However, Galla (2016) shows how teaching and learning indigenous languages can be influenced by technology. Her research reveals the diverse purposes digital technology has been used in indigenous language recovery. The results show a rising acceptance and agreement by applying computer-assisted language learning for teaching, maintaining and stimulating minority languages. The context of how to use the technology among indigenous population is also addressed by Galla (2016).

There is broad existence of technological tools for learning and teaching languages that the indigenous population lacking access to technology thus cannot access. Given that the use of digital technology in the education field improves students' performance in different subjects and being used as part of the new curriculum in different countries.

(Roy and Wylie, 2016) show the evolution of the technology in education. They introduce a study which had the central objective to answer questions about Artificial Intelligence in Education (AIED): “What are our major strengths? And, what new opportunities lay on the horizon?” (Roy and Wylie, 2016) 47 seven papers from Journal of the AIED were analyzed from three years in the history (1994, 2004, and 2014) to identify the efforts and common situations occupied by the field of AIED. It discussed whether the use of artificial intelligence in education needs a new direction, they asked for a revolution.

Studies have shown different ways to use technology to teach and learn languages. Lee (2014) says that using digital news stories as an educative approach to justifies using technology to develop students’ content acquaintance and oral language skills. Lee presents a study where data were collected from different sources, providing a better view of how the use of technology improves language acquisition. She analyzed digital news recordings, replications, online surveys, and interviews to validate how technology can improve languages studies.

When talking about indigenous people, languages, culture, values, and technology, it is important to mention the Mayan population who have kept their native language after colonization of the Spanish language and culture. Peckham (2012) searches language philosophies, code-switching, and ethnolinguistic identity about Mayan people in certain areas in Mexico and Guatemala. Peckham shows an analysis of two extensive case studies from Guatemala and Mexico, focusing on identity construction, bilingualism (code choice) and language methodologies. The author clearly describes the Mayan languages that are still spoken in Mexico and Guatemala. She

supports the claim of giving the opportunity to Mayan people to usage of digital technologies might help the preservation of their languages, acknowledging the disadvantages indigenous people have confronted in traditional educational systems where their first language has not been taken in consideration when designing curriculum.

It is known that indigenous people are disadvantaged in large-scale assessment programs where a second language is not known accurately (but is the language of testing) and even if the test is offered in the first language, because that's not a language of schooling, the first language also is flawed as testing medium. Solano-Flores and Backhoff (2015) present results from a study that examined inexact results in large-scale assessment programs of indigenous population due to linguistic diversity in the area of Mexico. In this research, students aged 5 to 6 years in a Mexican preschool were asked to take different test items in three different versions: original in Spanish, Mayan translation, and content equivalent, developed from scratch in Mayan. The results may be different when the students know the first language well as the second language as well.

On the other hand, there are some Latin American countries using technology to develop education approaches in indigenous language teaching and learning. There is an existing prototype to learn and teach Quechua, an indigenous Bolivian Language. Quisque (2017) shows the analysis and results of using artificial intelligence in teaching Quechua. Here, Quisque supports the argument of teaching of languages is very practical when using new information communication technologies (ICT), and using computers as a main tool in education. She shares the results of the prototype of an educational program using technology to teach Quechua. This prototype creates tests to evaluate

students according with the level of language acquisition. The results were positive after evaluating the prototype which creates a pathway of using technology to support indigenous languages.

Also, Virtaen (2015) studied the function of social media in indigenous communities in Southwestern Amazonia. Virtaen looked at both the digital technologies that are being used in indigenous communities, and the culture aspects while using social media. The main aim is to address the question of “how new digital communication is (re)shaping indigenous relationships”. Through ethnographic research, Virtaen described clear examples of the motivations to use social media in Amazonian Brazil. In brief, she mentions the cultural values involved while using social media in this specific community.

Although initial research on this topic is promising, the literature shows that there remains a need for creating ways of include indigenous people, language, culture in technology, and therefore it is important to create a revolution on education and technologies including minority languages into the educational system. (Roy and Wylie, 2016)

Indigenous Language education in Guatemala

The Mayan languages started being threatened with the colonization of Guatemala by Spain in 1524. During this time and continuing for centuries, the Spanish kingdom intended to “castilianize” the Mayas. When Guatemala gained independence teaching Spanish and ignoring Mayan languages remained the dominant policy. (Helmberger, 2006). The new independent government ruled by Ladinos wanted to unify and create a single Guatemalan nation state, and saw the promotion of a single language (Spanish) as

a means to that end. The idea was to eradicate every Mayan language to follow the nationalist agenda. (Bitar & Juarez, 2008)

Bitar and Juarez (2008) mention that since 1824 in the first Guatemala's constitution, leading by the nationalists it was focused to deinstitutionalize and marginalize the Mayan languages. The Decree of the Congressional Congress in 1824 mandated “the ‘extinction’ of the Indian languages due to the fact that they were so ‘diverse, incomplete, and imperfect’, and ‘insufficient for enlightening the people or perfecting the civilization’” (Lewis, 1993).

The Instituto Indigenista Nacional (IIN) was created in 1940s to supervise indigenous matters. During those years it was dictated that Mayas could receive education in their mother tongue. However, the idea of including the mother tongue to primary education was to learn Spanish fluently in a transitional model. The IIN helped to develop a Roman character, Mayan language alphabet. This alphabet was not inclusive of the Mayan languages; this alphabet deleted diacritical marks, just to make easier the translation to the Spanish Language. (Richards, 1993). In 1985 a new Guatemalan constitution was rewritten, and Spanish was declared the official language, which made it mandatory to teach only Spanish in schools. (Helmberger, 2006).

Integrating Mayan Language into the education system agenda

After the Peace Accords, Mayan languages are considered important to be added into the national agenda. An example of it as Maxwell (2011) mentions is the passage of the Language Law (Ley de Idiomas) in 2003 approved equally official status with Spanish to each Mayan language in the places where it is spoken. Importantly, this

legislation brought specific rights to the Mayan community speakers of each language, with the right to access legal services and health in Mayan language.

Though, it is more theoretical, in daily basis, the laws are not implemented, and the rights created are not satisfactorily upheld and redressed.

Mayan languages in Guatemala are alive, in most rural towns the transmission of the mother tongue to children is still happening.

Nowadays, bilingual Maya-Spanish programs in primary school education is improving and it this advances are guided by the Board for Bilingual Education (Dirección General de la Educación Bilingüe, DIGEBI), In some rural public schools, bilingual education is provided in the first years of schooling. Besides this, the National Committee for Maya Education (Comité Nacional de Educación Maya, CNEM) is a new movement where communities and parents are guiding the bilingual schools. (Tummons, E., Henderson, R., & Rohloff, P. 2012)

Mayan communities are strong to keep their heritage alive, indeed, in areas that were damaged, and they were almost destroyed during the civil war, it has been optimistic progress, like young population are interested in Mayan languages for new educational opportunities for Mayan language speakers. (Maddox, 2010).

In many Mayan families, historically parents discouraged practice of Mayan languages being scared that their children would be victims of discrimination in school that they had experienced. (Carey, 2006)

The new generation is trying to get involved in teaching the language to non-Mayan speakers.

Taken together, therefore, although Mayan languages have achieved major legal and societal gains in post-Peace Guatemala, there remain serious doubts as to the future of Mayan language revitalization. There is limited utilization of Mayan languages in public spheres other than primary school education, despite the provisions of the Language Law of 2003. Furthermore, primary school education is undercut by inadequate pedagogical materials, poor teacher training, and inefficient promotion of productive speech. (Tummons, E., Henderson, R., & Rohloff, P. 2012)

The major attempts of language revitalization in Guatemala are focused on primary and secondary education where the indigenous languages are included now as (third language) L3 in Spanish speakers' schools.

These efforts made in schools could help improve the social symbolic value of the indigenous languages, the probabilities of keeping the language alive are low, due the fact of the inefficient Mayan language acquisition students are having in such programs. The truth is that in Guatemala, Mayan languages cannot be used with a lawyer, a doctor or businessman despite the reinforcement of laws for Mayan language inclusion. Furthermore, Spanish language is still the key for economic progress. (Carey, 2006)

Consequently, more than two hundred years Guatemala declared its independence from the colonial government, the relationship between “between Indigenous and non-Indigenous people remains similar to that of typical colonial situations.” (Lopez, 2008) He additional asserts that new legislation recognizes indigenous and cultural diversity as fundamental aspects of Latin American societies. However, many people, especially the ethnic and social sectors in power, continue to think that having a country of linguistic diversity is a problem and an impediment that endangers “national unity”. In Guatemala, for instance, bilingual education is limited to teaching and partially using the Indigenous language for the first three or four years of basic education, under the classical early transition approach. (López, L. E. 2008).

Lopez, (2008) further suggests one characteristic that are currently common by most Indigenous bilingual education programs in Latin American countries is the opportunity of their application is limited to the most spoken languages. For example, in Guatemala, it's been at least 30 years of promoting bilingual education, linguistic projects have focused on the four most-used Maya languages – Kaqchikel, K'iche' Mam, Q'eqchi' – compared to the disadvantage of the other 19 Mayan languages spoken in other Guatemalan regions.

Guatemala has 22 Mayan languages, Achi', Akateko, Awakateko, Chalchiteko, Ch'orti', Chuj, Ixil, Itza', Kaqchikel, K'iche', Mam, Mopan, Poqomam, Poqomchi', Popti', Q'anjob'al, Q'eqchi', Sakapulteko, Sipakapense, Tektiteko, Tz'utujil y Uspanteko and three other national languages, Spanish, Garifuna, Xinca. (Ley de Lenguas Mayas, 2018).

In 2015, Guatemala had a an estimated population of 16 million people; according to the National Employment and Income Survey, the indigenous population represents close to 40%, that is, 5,770,479 people. The majority of this population is a speaker of one of the 22 Mayan languages. This means that approximately half of the Guatemalan population is Maya-speaking.

Harbert, 2009 recognizes the fact that language endangerment is closely connected to poverty. He also mentions that all around the world, indigenous communities are linguistic marginalized and the access to unbiased health, education, and economic opportunities.

The World Bank web page mentions that Guatemala, the biggest economy in Central America, has one of the highest inequality rates in Latin America, with some of the worst poverty, malnutrition and maternal-child mortality rates in the region, especially in rural and indigenous areas.

The report from UNESCO (2019) shows that the highest number of poverty is among indigenous population in Guatemala. In most of this rural communities which indigenous people belong to are below the total of poverty line, for example, Santiago Atitlan in Sololá department, (93,3%), Santa Lucía la Reforma in Totonicapán (97,8%), San Juan Cotzal, Quiché (97,8%) and Chisec in Alta Verapaz (97,3%).

Furthermore, the literacy rate for indigenous men and women over 15 years of age is 74.6% and 51.9%, respectively, a figure significantly lower than the non-indigenous population.

Legal support for the indigenous languages and interculturality based on International Agreements and Guatemala Constitution.

- Agreement on Identity and Rights of Indigenous Communities signed in 1995 by the United Nations Mission.
- In 1991 the Guatemala's Government signed a document called "Ley Nacional de Educacion" (The National Education Law).
- In 2003 the Guatemala's Government signed a document called "Ley de los Idiomas Indigenas" (Indigenous Languages Law)

- In 2004 the Guatemala's Government signed a document called "Ley de generalización de multiculturalidad e interculturalidad" (Multicultural and Intercultural Law).

«Recognizing the role that corresponds to the communities, within the framework of municipal autonomy, for the exercise of the right of indigenous communities to decide their own priorities in what concerns the development process, and in particular in relation to education, health, culture and infrastructure, the Government undertakes to affirm the capacity of said communities in this area» (Identity and Rights of Indigenous Communities Agreement, 1995: 8, electronic version).

«The projection that the Mayan community and others have had is recognized and continues to be indigenous communities in the political, economic, social, cultural and spiritual. His cohesion and dynamism has allowed the Mayan, Garifuna and Xinca communities to conserve and develop their culture and way of life despite the discrimination of which they have been victims » (Identity Agreement and Rights of Indigenous Communities, 1995: 8, electronic version) ».

Although the right to education has been recognized internationally own in different agreements since the 90's, the Constitution of the Republic of Guatemala will continue to be the major law and therefore the most important law. Until the higher education articles and that the CEPS continue without allowing the legalization of other universities who do not agree with their interests, new educational ventures will continue without having space within the legality of the country. Not only does it apply to indigenous communities, who have for obstacle a double barrier, state racism and lack of

capital to start a project of this type, because the only remaining legal alternative is that they become or believe as private universities, issue that so far does not interest them.

It is also mentioned that the Ministry of Education in its Strategic Education Plan 2016-2020 the principal actions in the cultural component is, responding to the linguistic and cultural characteristics of the peoples through the educational and multicultural and intercultural services that respect diversity. Theoretically, equity in education promoting bilingual education at all levels and modalities, providing the methodology, material and conditions for the bilingual education implementation. Guatemala is doing efforts to support Mayan language education through its governments, indigenous organizations and non-governmental. There is already a significant production of texts in Mayan languages by the Association of Mayan Educational Centers (ACEM).

K'iche' and Kaqchikel Mayan Language

K'iche' language is the major spoken in Guatemala. Commonly spoken in Quiché department: Chichicastenango, Chiché, Cunén, Joyabaj, Sacapulas, San Andrés Sajcabajá, Uspantán, Zacualpa municipalities; Quetzaltenango, Retalhuleu, Sololá, Suchitepéquez, and Totonicapán departments; some communities in Huehuetenango and Baja Verapaz departments. (Ethnologue.com).

Kaqchikel is one of twenty-two Mayan languages spoken in Guatemala. Approximately 500,000 people across forty-four municipalities in the central highlands between Lake Atitlan and Guatemala City speak one of Kaqchikel's eleven regional dialects: Acatenango Southwestern, Central, Eastern, Northern, Santa Maria de Jesus, Santo Domingo Xenacoj, South Central, Southern, Western, Yepocapa Southwestern, Mixed Language (Ethnologue.com).

Eddy (2010) mentions that even bilingual speakers and readers are good at acquiring a third, or fourth language. However, the educational system doesn't create the conditions for learning Spanish well, and it creates an obstacle for native speakers of Mayan Languages that obstruct the development and language skills. Based on my own experience with the educational system in Guatemala, indigenous communities have Spanish literacy programs which are not friendly to the language spoken in the community and just a few non- Mayan teachers read and write Mayan language.

Consequently, educational relegation supports a larger socio-cultural/linguistic relegation that causes damage to the uniqueness and perspectives of many Mayan community. Eddy, (2010) said that the “western perspectives often clash with Mayan traditions and viewpoints” perceiving that those specific factors influence Kaqchikel learners in the classroom.

However, according to DeChicchis, J. (2012) the Mayan languages are alive and growing between the mother languages. The written Mayan language evolved from the old traditional Mayan script to Roman, over a nearly 200-year period. Also, Protestant Christian missionaries are important characters of the renaissance of the Mayan scripts since 1960s (DeChicchis, J. 2012).

There is an important number of Mayan people who can read and write nowadays. It is interesting to mention how the Mayan languages have evolved from stelae (standing stone slabs), stone lintels, sculpture brushes to write, to quills, pens, pencils, and ballpoint pens. The Mayan script in Latin has slowly helped Mayan people to access to further education and to use typewriters to express themselves in their own language. (DeChicchis, J. 2012). Recently, literate Mayan people switched from typewrites to

computers, being able to send E-mails messages written in their own language, and I have observed that now they are composing and sharing the language with cellphones by using social media.

Legal Framework of higher education in Guatemala

The highest law that governs Guatemala is the Political Constitution of the Republic. In the constitution the legal standards that regulate Indigenous Communities and Higher Education can be found. In places, the legal framework of higher education in Guatemala offers glimpses of the officially expected and desired roles of indigenous communities within it.

In the Political Constitution of Guatemala, in the third section entitled "Indigenous Communities", Articles 58 and 66 to 70 delineate recognize various rights of the indigenous communities of the country (Political Constitution of the Republic of Guatemala, 1993). According to Article 58:

«Art.58. Cultural identity. Is recognized the right of individuals and communities to their cultural identity according to their values, their language, and customs» (Political Constitution of the Republic of Guatemala, 1993).

Then Article 66 further clarifies:

"Art. 66. Guatemala is made up of various ethnic groups, including indigenous groups of Mayan descent. The State recognizes, respects, and promotes their ways of life, customs, traditions, forms of social organization, the use of indigenous attire in men and women, and their languages and dialects (Political Constitution of the Republic of Guatemala, 1993).

However, in the Fifth Section of the Constitution called “Universities,” in Articles 82 to 90, the possibility of creating a guaranteed indigenous higher education institution for the country is blocked. The only public university endorsed by the State is and should be the University San Carlos de Guatemala which is given legal recognition, legal personality, state budget, and autonomy to carry out its educational purpose (a purpose it has had for more than 300 years even though the constitution is only 27 years old at this point). San Carlos is the only one State university in the country. An example of this is defined in the following articles:

"Art. 82. Autonomy of the University of San Carlos de Guatemala. The University of San Carlos de Guatemala is an autonomous institution with legal personality. In its unique character the state university is exclusively responsible for directing, organizing, and developing superior education and state university professional education, as well as the dissemination of culture in all its manifestations (...)» (Political Constitution of the Republic of Guatemala, 1993).

"Art. 84. Budget allocation for the University of San Carlos de Guatemala. Corresponding to the Universidad de San Carlos de Guatemala (USAC), a private allocation of not less than five percent of the General Budget of Ordinary Income of the State, and an increase should be sought adequate budget to increase their student population or to improve the academic level» (Political Constitution of the Republic of Guatemala, 1993).

These articles show the state and constitutional monopoly that has been given to the USAC in Guatemalan higher education. Following the regulations for the USAC come the articles delineating Private Higher Education. These establish and recognize

private universities as independent of the State and legally guaranteed as soon as they comply with what is required. Also the Constitution governs that it is not the Ministry of Education that will regulate higher education but the CEPS (Council of Private Higher Education) in the country.

"Art. 85. Private universities. Private universities, which are independent institutions, are responsible for organizing and developing the private higher education of the nation, in order to contribute to professional training, to scientific research, to the dissemination of culture, and to the study and solution of national problems. When the operation of a private university is approved, it will have legal personality and freedom to create its faculties and institutes, develop its academic and teaching activities, including the development of their plans and study programs (Political Constitution of the Republic of Guatemala, 1993).

Art. 86. Council of Private Higher Education. The Council of Higher Private Education will have the functions of ensuring that the academic level is maintained in private universities, without undermining their independence, and authorizing the creation of new universities; the Council will integrate two delegates from the University of San Carlos de Guatemala, two delegates from private universities, and a delegate elected by the presidents of professional associations that do not hold any position at any university (Political Constitution of the Republic of Guatemala, 1993).

Then the Constitution describes the recognition given to the graduates of universities in the country. This recognition only has national validity when it come from universities legally authorized at the national level or if they are granted by Central

American universities that have formalized a basic alignment of curricula with the USAC.

"Art. 87 Recognition of degrees, titles, diplomas, and incorporations. The only degrees, titles, and diplomas that will be recognized in Guatemala are those awarded by legally authorized universities and organized to operate in the country, except as provided by international treaties. The Universidad de San Carlos de Guatemala is the only one empowered to determine the qualifications of professionals who have graduated from foreign universities and to set the prerequisites that for this purpose have to be fulfilled, as well as to recognize titles and diplomas of university character protected by international treaties. The degrees awarded by Central American universities will have full validity in Guatemala when the basic alignment of the curricula is verified. (...) » (Political Constitution of the Republic of Guatemala, 1993).

These are the articles of the Guatemalan Constitution referring to indigenous communities and higher education. As you can see, there is no space for recognition or legalization of official or public centers of indigenous higher education in the country. Instead, it recognizes the indigenous in a very folkloric way, acknowledging the "cultural heritage of the country" but no right to self-determination in tertiary education. This determines that the Indigenous population must be trained under state or private education in the country, without having any other option, nor a legal framework to form their own higher education centers created according to their self-determined needs and worldview.

However, since the 1990s, another series of government and international agreements have emerged that do guarantee the possibilities of indigenous universities in

the country. They do not necessarily mention the word “indigenous universities” but they do promote the responsibility of the people for the autonomy of their education and professionalization even at the top.

In 2019, 187,014 thousand students were enrolled at the University of San Carlos, according to the Department of Registration and Statistics, indicating that only 1.2% of the total population of the country had the opportunity to access public higher education. In the case of young indigenous Maya, only one in 10 students at the USAC is indigenous. The III University Student Census of the USAC of 2009, indicated that of the total of students enrolled (approximately 100 thousand at that time), 10% identified as a student Maya, 0.12% as Garífunas, 0.20% as Xinka, 72% as Ladino, and 16% as ‘half Blood’. That means that it has been the young Ladinos / mestizos who have had the greatest opportunity to access to higher education in the country at the public level and even greater at the private level where the indigenous proportion is even smaller. Higher education in the country is centralized as soon as the USAC data show that in 2011, of 153,112 students enrolled, 68% registered in the central campus and 32% in other municipalities of the country. This indicates that the USAC, at least in its central campus, has maintained a central and urban character being a public entity, which also maintains its exclusionary character for young indigenous people who are more often based in rural area. However, the urban dominance of higher education also has had cultural repercussions in terms of young women. Many have migrated to the city for education. This theme will be further addressed in my research showing the three indigenous female professors teaching in Guatemala City.

CHAPTER 3: METHODOLOGY

Research questions

1. How do the professors use technology while teaching IDI3 Mayan Language in the Faculty of Humanities at the Universidad de San Carlos de Guatemala?
2. In what ways do indigenous language-speaking professors describe their experience of teaching their language and culture to Spanish language speakers at the Universidad de San Carlos de Guatemala?
3. In what ways do students engage with the use of technology for the purpose of acquiring language skills in the Mayan language as a third language?

Research Approach

The purpose of this qualitative study was to examine how Guatemala professors use technology in their Mayan language teaching classrooms and their experience of teaching their language and culture to Spanish language speakers at the Universidad de San Carlos de Guatemala. Research was conducted by observing classes and interviewing teachers. The findings explore the areas of teaching a language and its culture, teaching in general, and technology integration in teaching, teaching of indigenous language to Spanish speakers.

This study can inform how Guatemalan professors can enhance their teaching methodologies with technology integration. The technology in the classroom has been a useful tool to introduce a new educational approach for students. The observations allowed me to consider how students and professors interacted in the IDI3 vernacular language class by integrating technology in classroom.

Context of study

Research for this study was conducted in the Humanities Faculty, Pedagogy Department at Universidad de San Carlos de Guatemala where I have taught and therefore have multiple connections. The Universidad de San Carlos is a public, autonomous, non-profit, and secular university pursuant to the 4th section of Article 82 from the Political Constitution from Guatemala. The Pedagogy department is located at the second floor of building S-4, Facultad de Humanidades, Universidad de San Carlos de Guatemala, zone 12, Guatemala City.

The Humanities Faculty's institutional vision is to "become the lead entity, in training humanist professionals with scientific and technological basis according to socioeconomic, cultural, geopolitical and educational circumstances for making an impact on the policies of national, regional and international development." (Rosales, 2017) Rosales also describes the Facultad de Humanidades as the vehicle for training professionals who can challenge various national problems. In 2009, the board members of the Humanities Faculty decided to include Guatemalan vernacular languages into the curriculum for Pedagogy and Educational Administration majors. This step was consistent with the 1996 Peace Accords which had added indigenous languages into the primary and secondary educational system.

The IDI3 Mayan Language class is common called the Vernacular Language class. It is taught for the Pedagogy and Education Administration major for students who study all the shifts. In the Spring of 2019, there were more than 80 adult students attending IDI3 Mayan Language Class on weekly and weekend schedules. Most of the

students in the class lived in Guatemala City and 95% of the students taking the IDI3 Vernacular class had Spanish as their first language and the other 5% had a Mayan language as their first language.

The classrooms in this building had one blackboard. A projector and computer were available upon request at multimedia room.

Participants

Two professors in this study were bilingual educators, one professor spoke Kaqchikel and Spanish, another professor spoke K'iche' and Spanish. A third professor spoke three languages (Kaqchikel, Spanish, and English). They were three female professors each working in different shifts. They had 30-40 students each. The three professors had each been teaching IDI3 Vernacular Language Courses for more than seven years. The three teachers lived around the urban areas of Chimaltenango, Quiché, and Guatemala City respectively. Each described using social media on a daily basis and having access to technology resources.

Data collection

To conduct one of the interviews, I used the WhatsApp mobile application to set up the time and the place. Two of my former University of San Carlos students Regina Blanco and Elmer Valle provided the computer and voice recording tool to keep track of the interview while using WhatsApp to share messages and send the interview questions in advance. For the other two interviews I traveled to Guatemala City in June 2019. Various forms of data collection were used in this research. Semi-structured interviews were performed with the three professors participants of the study to know more about their use of technology for a Mayan Language class as a third language (in addition to

Spanish and English) and their perception of teaching a Mayan language to postsecondary students.

Also, their classes were observed to see how the and how much the faculty used technology and how students interacted with the technology. Field notes about the classes observed were taken and artifact like assignments, student's notebooks, and syllabi were collected.

Informed consent and protecting the right of the participants

Before the interviews and class observation, I sent the facilitators and students the informed consent forms which they then completed. I explained the objectives of the research and why it was important to sign to confirm their authorization to participate in the study.

Data Analysis

Several steps were taken to analyze the data I collected from my study. First, I typed up the handwritten field notes after each class observation. I also listened to the audio recording, watched the video interviews, and transcribed professors' interviews in Spanish, then I translated them into English.

Once, I had all the data, I started organizing them by reading through the interviews and field notes more than three times. From the collected data, I then determined the recurring themes.

CHAPTER 4: FINDINGS

In this chapter, I share information about the three Mayan language professors. The analysis of the interview transcripts and class observations were organized into common themes. The interviews also show the Mayan language professors describing, their good experiences and hopes.

The research was focused on three professors Elda Marroquin, Blanca Estela Colop, and Reyna Siquinay from the University of San Carlos, Humanities Faculty who were teaching Mayan languages to undergraduate education students. During Spring 2019, Elda taught Idi3 Kakchikel levels I, II, III and IV levels; Blanca Estela taught Idi3 K'iche' levels I, II, III, and IV, and Reyna taught Kakchikel levels I, II, III, and IV.

Table 1. Years of experience, education, use of technology, Mayan language, Other language

	Years of experience	Education	Use of technology	Mother language	Other Languages spoken
Elda Marroquin	15	Bachelors	Yes	Kakchikel	Spanish
Blanca Colop	16	Master of Arts in Linguistic	Yes	K'iche'	Spanish
Reyna Siquinajay	10	Master of Arts in Linguistic	Yes	Kakchikel	Spanish and English

These professors were chosen as participants of the research because they had volunteered and taught the relevant topics. They were multilingual teachers who self-identified as part of a Mayan community in Guatemala, they had more than ten years of experience teaching Mayan language. See table 1. The following section describes the exploration of the interviews in depth of each of the professors.

Participants.

The following information was derived from transcription of audio recordings, and additional analysis of these written transcripts. Complete names were used for the three participants. Findings are presented in the order each professor was interviewed.

Elda Marroquín, a Kaqchikel Mayan language Instructor

Elda Marroquin shared about her life and started by talking about her dad, an elementary school teacher, and her mom, a nurse. Both parents encouraged her to speak both languages at home. Her dad had the idea to help her to keep the Mayan language while improving the Spanish learning. “La idea fue de mi papá, y consistió en hablar el idioma Kaqchikel con él y el idioma español con mi mamá en casa...” [It was my dad’s idea, he made us speak Kaqchikel Mayan language with him and speak the Spanish language with my mom at home...]

Elda completed her elementary school by mastering the Spanish language and keeping Kaqchikel for speaking purposes. She completed high school at the Escuela Normal Rural Pedro Molina in Chimaltenango. [At normal school graduates were trained to become elementary school teachers.] She explained that the Escuela Normal was “donde me enseñaron a leer y a escribir en mi idioma materno...” [where I was taught to read and write in my mother tongue]. Additionally, she added that she had the opportunity to work at Academia de Lenguas Mayas de Guatemala ALMG. There, she learned new methodologies and approaches of how to teach Kakchikel by using the Kumatzij Method.

Kumatzi means “spiral learning” in K’ich’e language and the method could be used to teach that language too. See figure 1.

“Con esta metodología se incluyen diferentes actividades, juegos donde los estudiantes no están sentados en sus escritorios e incluso pueden usar el idioma Kakchikel con los juegos tradicionales.” [With this methodology different activities are included, games where students are not seated at their desk and where Kakchikel language is used with traditional games].

Figure 1. Diagram of the `Kumatzij` Method for teaching maya languages used by one of the participants of this study. Image taken from the book `Kumatzi Method` by Argueta, B (2009).



By working at ALMG she got the opportunity to continue postsecondary education, earning her bachelor's degree in Pedagogy and Education Administration from Universidad de San Carlos de Guatemala. She explained, “En la Universidad me profesionalicé y aprendí a planificar y organizar programas de cursos”. [I became

professional at the university; I learned how to plan and organize syllabus for different subjects.]

In 2008, she started working at the Humanities Faculty, Universidad de San Carlos as part of the evaluation committee of the institution and that same year she became the Kaqchikel Mayan language instructor for the class IDI3 Vernacular Language. Currently, she is a full-time professor and the afternoon shift coordinator. She has to teach in regular semester and vacation courses as well. Her administrative job helps her to keep the Mayan Language program updated and ready for evaluation by the evaluation committee. As part of her administrative duties, she is in charge of organizing and evaluating the other professor teaching Kaqchikel language.

Teaching Mayan language and culture to college students

Elda is happy to teach her mother tongue to students at the university. “Con el aprendizaje del idioma Kaqchikel al estudiante se le abren las puertas a la cultura de mi comunidad y la riqueza que existe en la interacción de una cultura a otra” [Learning Kaqchikel, students get an open door to the culture in my community, and the richness experience of interacting from culture to another]

She really enjoys explaining to the Spanish-speaking students the complexity of her language and why indigenous people seem to repeat words while speaking Spanish, a trait they carryover from their first language. In her words, “Por ejemplo, para decir buenos días, se le debe agregar la palabra gracias al final, y sería, buenos días gracias, “Saquer qa’ Matiox”. [for example, to say good morning the word thanks needs to be added at the end, and it will sound like Good morning thanks, Saquer qa’ Matiox.] She

explains that teaching Kaqchikel gives her the opportunity to explain her culture and teach about the linguistic differences indigenous people have when speaking Spanish, “Algunas veces la gente piensa, ... -¡esa persona no puede hablar bien! Pero resulta que están hablando el idioma español desde su idioma materno, donde se agradece todo lo que nos rodea” [Sometimes, people might think, They don’t speak very good, (Spanish). But they speak Spanish from their mother tongue perspective in which “thanks” is added to the end of everything.]

During my observation, Elda’s class was really active, and she started with new vocabulary, greetings, and conversations by using words commonly used on a daily basis in her community. Students copied in their notebooks what she wrote on the board. She also brought some worksheets with conversations to practice with the students. She explained how the course was divided by showing a syllabus of the class. She explained me that, “La primera parte es la doctrinaria, donde discutimos sobre el idioma, la cultura y el aprendizaje desde la cosmovisión Maya.” [First, it is included the doctrine, where we discuss about the language, culture and the learning process from the Mayan cosmovision.] Then the program turned to the language acquisition process and then finally to the integration of the content, which set up an evaluation of the students’ language acquisition and cultural appreciation.

Elda explained, “Yo he incluido en mi curso, la visita a comunidades Maya hablantes para que los estudiantes tengan el contacto directo en el uso del idioma. Entre las actividades que realizan están los saludos a personas en la calle, uso del idioma para comprar, y de esta manera mejorar la pronunciación” [I have included in my course, a visit to Mayan speaking communities so that the students have direct contact in the use of

the language. Some of the activities they carry out are greeting people on the street, using the language to buy things, and through this to improve their pronunciation] She also tried to include different activities inside the classroom. Some students had asked for donations of books in the Kaqchikel language as part of their own motivation to help Mayan language program.

She asserted that she did not have any obstacles as a teacher of a Mayan language at the university. The Spanish-speaker students' "ladinos" were thrilled to have the language as part of the curriculum. However, she acknowledged that the Mayan languages classes did not have the same amount of time as the World Languages classes did. She concluded that it would be a good idea to include more Mayan language class hours in the future.

Memories of teaching a Mayan Language at the University

She shared that every time she taught Kaqchikel, she could dignify the memory of her ancestors. Elda also brought into her classroom the warmth of her home, her family and her own community, as values to be shared. She went on,

“También me ayuda a recordar mi niñez, mi niñez fue muy particular, llena de momentos alegres, vivencias con mis abuelitos, quienes nos recibieron en su casa para que pudiéramos estudiar, esa es una mis razones fundamentales para enseñar, transmitir el valor de la familia y el respeto, el respeto a los demás.” [It also helps me to remember my childhood. My childhood was very special, full of happiness, living with my grandparents, who hosted us in their home so that we could study. This is one of the core things to teach, the value of family and respect, respect for others.]

The use of technology in the classroom

She characterized her use of technology in the classroom as a weakness. She said that it is hard for her to use other technology beyond a computer. The Humanities Faculty provides technology resources when instructors ask for them in advance. She had attended different workshops related to the use of technology, but had not had the time to incorporate that learning to move from a traditional teaching methodology towards a more technological approach. In her words, “La falta de tiempo, entre todas las actividades docentes y administrativas no me permite enfocarme en el uso de la tecnología. Me encantaría usar programas para grabar la pronunciación y usar en clase.” [Lack of time between teaching and administrative tasks doesn’t allow me to focus on the use of technology, I’d love to use applications to record pronunciation to and use them in class.]

She also noted that she shared her need for someone to help her to use technology in the classroom. A person started offering her that help, but he got sick and there was not any follow up. Elda pointed out that it would be helpful to have someone to work with her specifically in the use of technology, to help her deciding what to use and what not to use in the language learning process.

Elda agreed that students would have a different experience in learning Kaqchikel if integrated more technology in the classroom, but acknowledged her limitations: “...De uno a cinco, yo le doy dos al uso de la tecnología en clase.” [On a scale from one to five, I give myself a two for technology in the classroom.] She pointed out that, “Una de las ventajas de usar tecnología en clase es que el estudiante pueda utilizar la información en

horario fuera de clase” [One of the advantages of using technology in the classroom is that the student can have access to the information outside of the time parameters of the class.].

That all said, she did explain that she used Whatsapp with her students. “El Whatsapp es una de las herramientas que utilizo como herramienta tecnológica para interactuar con mis alumnos, y además, envío la pronunciación de palabras desde esta aplicación” [WhatsApp is one of the technological tools I use to interact with my students, and I also use it to send them the pronunciation of words.]

Blanca Estela Colop, a K’iche’ Mayan language Instructor

Blanca was from Totonicapán, a Guatemalan department (similar to a county) located in the western highlands. She belonged to a K’iche’ Mayan community where she used the K’iche’ the language on a daily basis with her family and friends. She had a bachelor’s degree in pedagogy and education science from Universidad de San Carlos de Guatemala. She also had a Masters degree in intercultural bilingual education.

“Yo trabajé durante 12 años en el Centro de Aprendizaje de Lenguas CALUSAC, de 1995-2007, luego inicié a trabajar en la Facultad de Humanidades hace cuatro años.” [I worked 12 years at CALUSAC, from 1995-2007, then I started working at the Humanities Faculty four years ago.]

Blanca published her own K’iche’ book (see Figure 2) to teach the language while she was working in Centro de Aprendizaje de Lenguas CALUSAC. She was guided by a professional linguist to organize the content in the book. The book includes different

sections: history of the language, culture and philosophy, grammar structure, dialogues, vocabulary and various activities for the students learning K'iche'.

The Nab'e Mayan Language book (Nab'e means "one" in K'iche'). It emphasizes dialogues, then from the dialogues comes the grammar explanation and then the practice of the language. She mentioned different studies she has conducted and international conferences that she has attended. All of them focused on indigenous languages.

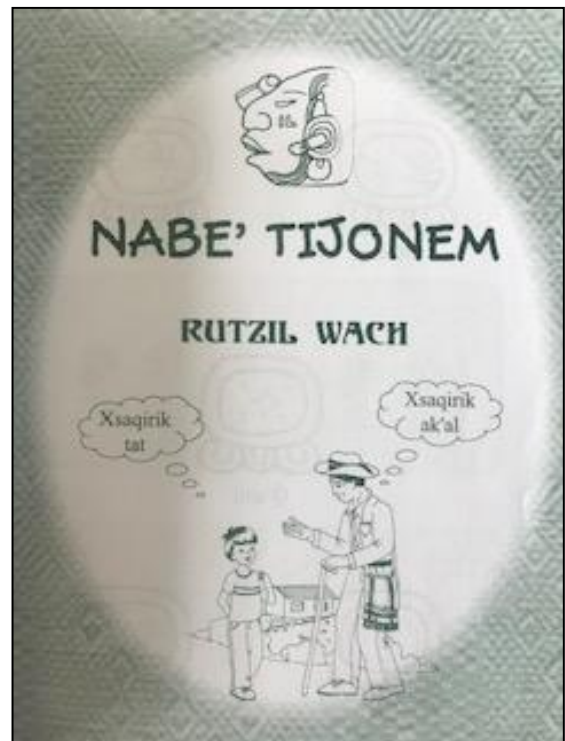
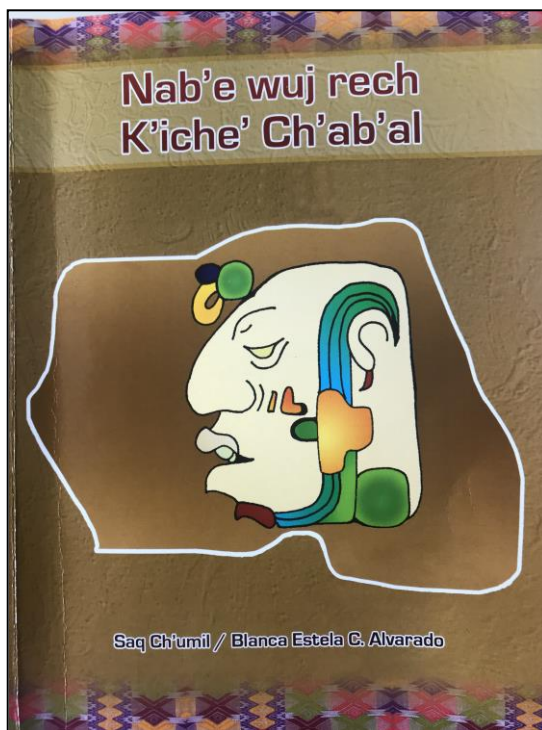


Figure 2. Book authored by Blanca Estela Alvarado, one of the participants of the study, titled Nab'e wuj rech. This book teaches students level 1 Quiche language.

Teaching Mayan language and culture to the students

She stated, “El idioma Quiché es mi idioma materno.” [K’iche’ is my mother tongue.] Before answering the question, what encourages you to work as a K’iche’ language educator for Spanish speaker students? Then she added, “El idioma K’iche’ es el idioma mayoritario, es el que más se habla en el país...” [The K’iche’ Mayan language is one of the most spoken language in Guatemala.]

She was really motivated to teach and shared her culture and mother tongue to students at the university. She mentioned how proud she was of her mother tongue K’iche’ which she explained is also the mother of other Mayan languages.

Throughout my conversation with Blanca, she described that even she was happy to teach a Mayan language at the university though the income was too low. “It is not well paid to teach a Mayan language”, she concluded.

She argued that,

“Pero toda mi vida me pasé viendo que el Estado de Guatemala es deficiente en atender a la población mayoritaria (indígena) en este país. La Universidad de San Carlos también forma parte de esa deficiencia por no formar profesionales de las diferentes disciplinas para atender mejor a esta población en sus idiomas maternos, porque siempre lo hacen en español, y nunca se beneficia a la población guatemalteca, me refiero a la comunidad Maya.” [Through all my life, I have seen that the State of Guatemala is not efficient in serving the majority in this country (the Mayan population) nor the Universidad de San Carlos which lacked of preparing professionals from different disciplines to help the communities in their mother tongue, because they are only focused on the

Spanish Language, and the majority of the population in Guatemala, the Mayan community will never receive benefits.]

I could observe that she had a very good relationship with her students; she started the class greeting in K'iche' language. She used the K'iche' language all the time by adding specific translation of the new words being taught. She gave a review of the previous class by writing on the white board. Students used worksheets and a notebook to copy what Blanca was explaining. She taught two lessons every Saturday including written and oral practice. The Pedagogy Department at the Humanities Faculty provided her with the syllabus and specific topics to be taught. Even she had her own book; she was not able to ask students to use it.

She mentioned that she was disappointed when the authorities told her not to ask the students to use the book because it was not affordable for them. She explained to me that the first day of class she had students get the book for a reasonable price, and the authorities came to tell her not to sell nor to use her book.

She pointed out that, “ Y me pidieron que devolviera el dinero que me habían dado los alumnos para el texto y pues procedí a hacerlo, pero sinceramente, eso me hizo pensar en que es una actitud racista, la forma que me dijeron las cosas” [... and I was asked to give the students their money, and I did what they asked me to do; but, honestly, that made me think that it was a racist attitude towards me, the way they approached me.]

She concluded that one of the obstacles to teach the language is the low salaries she gets to teach K'iche' and the lack of opportunities to teach the language and get paid for it.

Memories of teaching a Mayan Language at the University

I asked her to share with me the good times of being a K'iche' language teacher, and she started by saying, “Uno de los mejores momentos que he tenido ha sido cuando tuve alumnos de diferentes facultades, profesionales en las diferentes disciplinas del conocimiento...” [...one of the most unforgettable moments I had was when I had students from different majors, professionals in the different disciplines of knowledge...]

She happily shared a good memory, and it was when within her class that the idea was discussed of creating the Instituto de Estudios Interétnicos (DEI) de la Universidad de San Carlos de Guatemala, which the English translation may be, Interethnic Studies Institute (IDEI). Blanca Estela was helped by Dr. Jorge Solares among other students design the project for creating the institute. On October 12, 1992, Instituto de Estudios Interétnicos (DEI) de la Universidad de San Carlos de Guatemala was established by the rector Dr. Alfonso Fuentes Soria. (Cocón, 2011)

Furthermore, she mentioned another memorable moment was when her students read the Popol Vuh, also called the sacred book of Maya.

“The Popol Vuh is the story of creation according to the Quiche Maya of the region known today as Guatemala. Translated as ‘The Council Book’, The Book of the People’ or, literally, ‘The Book of the Mat’, the work has been referred to as “The Mayan Bible” although this comparison is imprecise.” (Mark, 2014)

“Mis estudiantes leyeron el Popol Vuh desde el punto de vista de la semiótica, así también lo leíamos desde el punto de vista histórico. Fue un análisis profundo del Popol

Vuh, discutido en el idioma K'iche', el idioma original del Popol Vuh.” [My students read the Popol Vuh from the semiotics view; we also read it from the historical point of view. It was an in-depth analysis of the Popol Vuh; the discussion was held from the K'iche' language, its original language.]

Blanca showed she was proud of sharing and teaching her mother tongue and her culture to students from different professions who are not forced to learn the language. She likes to work with students who voluntarily seek to study the language. She said, “Me gustaría que el aprendizaje del idioma quiché no solo fuera un requisito en el p  nsum, si no que fuera verdaderamente un estudio sustancioso del conocimiento para las dem  s carreras de las diferentes facultades.” [I would like that the K'iche' Mayan language was not just a required class into a study plan, but to become a substantial study of knowledge for other majors.]

The use of technology in the classroom

Blanca explained that she can easily use technology to teach the language, but students can get distracted when using the technology in the classroom: “tal vez es   til, pero es muy entretenido, para la ense  anza de idiomas, (distrae a los alumnos f  cilmente).” Blanca described her ability in the use of technological literacy by saying the different tools she is able to use with the computer. “Lo que necesita es que el alumno conozca repita, conozca el vocabulario y lo memorice di  logos y cosas as  . No es tanto de presentar una imagen al alumno...” [What students need is to know and repeat vocabulary and memorize dialogues and stuff like that. It is not about showing an image to the students...]

“...sobre todo ahora que estoy enseñando el curso en vacaciones tengo tan poco tiempo. Yo no puedo utilizar como parte de la clase.” [Now that I’m teaching a vacation course, I don’t have enough time. I can’t use it as part of my class.] Blanca described herself as a self-taught person when learning technology, but she would like to receive formal training to integrate technology in her lesson plans. Blanca also mentioned that she regularly uses technology when she has to explain about the culture and history of the language but not to teach the language. “...lo que nos ayuda la tecnología para el aprendizaje de los idiomas, son los audios,” [... what technology helps to learn languages are the audios.]

The obstacles to use technology in the class is the lack of time she has. “Y ahora hay otros programas más avanzados que yo no manejo. Por ejemplo, esos que ya son más interactivos. Eso me interesaría aprender a utilizar.” [Nowadays, there are new applications, but they are more advanced for which I don’t have access, and they are interactive. Those are the ones I’d like to learn how to use.]

Reyna Isabel Siquinajay, a Kaqchikel Mayan Language Educator

“Soy maestra por vocación.” [I’m a teacher by vocation.] Reyna speaks Kaqchikel, Spanish and English. She studied at the Escuela Normal Rural Pedro Molina in Chimaltenango, where she graduated from high school as an elementary school teacher. She mentioned that she also holds a bachelor’s degree in pedagogy and educational administration. She was granted a scholarship to study business and English in the United States in 1992. “...cuando regresé, me incorporé a la docencia, porque me gusta mucho ser maestra y vi lo positivo de la docencia, y con el inglés tomé ventaja para continuar estudios universitarios.” [...when I came back, I continued in the teaching

major, because I really liked to be a teacher, and I saw the positive advantages of being a teacher, and with the English language acquired helped me to continue post-secondary education.]

She described a historical background where the Mayan language and culture was again part of the public policies after the signing of peace agreements in 1996. It was when she was invited to participate in a formal training at the Academia de Lenguas Mayas de Guatemala ALMG. "...y fue ahí donde recibí capacitación en la enseñanza de los idiomas mayas, y reforcé la escritura y la lectura de idioma Kaqchikel, porque sabía únicamente hablarlo, pero no escribirlo, el Kaqchikel es mi lengua materna." [... it was there where I was trained in teaching Mayan languages, and I improved my writing and reading skill of the Kaqchikel language because, I knew how to speak it, but not how to write it. Kaqchikel is my mother tongue.]

She told me that again in 2013, she was with a new scholarship, and she traveled to Montana to learn about American culture and techniques for teaching English language acquisition. "Eso me dio las metodologías en la enseñanza de idiomas." [It was there where I learned the different methodologies to teach languages.] She added that she started teaching K'aqchikel in 2013.

Teaching Mayan language and culture to the students

"Me siento muy motivada dando clases, todo lo que se hace con vocación se hace con pasión. A mí me apasiona ser maestra." [I feel so motivated when teaching, all that is done by vocation is also done with passion.] She mentioned that she feels fulfilled by teaching her own mother tongue. "Me hace sentir bien conmigo misma" [It makes me feel good with myself.]

During my observation of her class, I could see the different techniques and methodologies she used to teach the language and make students participate by using the language. Oral repetition, drills and chants were part of the class presentation she performed. Students used a notebook to copy instructions and vocabulary that Reyna asked them to copy. The syllabus is organized by modules and provided by the Pedagogy department from the Humanities Faculty, Universidad de San Carlos de Guatemala.

“Un trabajo usando creatividad, haciendo que los estudiantes creen su propio material de aprendizaje.” [It's a job by using creativity, making students create their own learning material.] I saw students sharing their colorful and meaningful final projects to help them remember and practice the language (see Figure 3).



Figure 3. Examples of group projects created by students of one of the participants of this study.

Reyna explained she usually uses real life situations to teach about the language.

“...por ejemplo, la palabra computadora en Kaqchikel, recuerde que antes no había computadora, pero en el idioma Kaqchikel tiene su nombre. Pero para traer una palabra moderna en idioma Kaqchikel lleva un proceso para su creación e implementación. ¿Qué hacemos?, usamos palabras desde la cultura Maya, es así que decimos - la computadora teje la letras- Kematz'ib', Kem es tejer y tz'ib' es letras, la unión de estas palabras es Kematz'ib' que significa computadora. [... for example, the word computer in Kaqchikel, the word didn't exist in the past, but it has a word in Kaqchikel. But, to bring a modern word in Kaqchikel language, it takes a process for its creation and implementation. What do we do?, we use words from the Mayan culture, that's how we say - the computer weaves the letters- Kematz'ib'. Kem means to weave and tz'ib', letter. The union of these words Kematz'ib' wich means *computer*.]

By giving this example, Reyna demonstrate how successfully she taught the Kaqchikel language.

Reyna also added that she uses chants and songs as her own way of introducing a topic. “Yo uso las canciones como parte de mi material, uso melodías conocidas y le agrego la letra en idioma Kaqchikel para que el estudiante recuerde el vocabulario. Enseñar con canciones, es lo que me gusta hacer...” [I use songs as part of my classroom material, I use well known melodies and I add lyrics in Kaqchikel language to help students memorize new vocabulary. Teaching with songs, it is what I enjoy doing...]

“Otro ejemplo, la marcha nupcial, uso la melodía para aprender los pronombres personales... No tengo tiempo para poder grabar o hacer material” [Another example, the

wedding march, I use the melody to teach pronouns... I don't have time to record or make class material.]

I could observe the different and creative material students had in class to practice vocabulary, from calendars to short stories all of them in Kaqchikel language. (Figure 3)

She stated that she doesn't have any obstacles to teach Kaqchikel. "He aprendido que uno debe esforzarse para lograr lo que desea; uno debe derribar obstáculos." [I have learned that we have to make an effort to achieve what we want; we must bring down any obstacles.]

Memories of teaching a Mayan Language at the University

Throughout the conversation it was evident that Reyna had enjoyed the time when students learned the language by singing songs created by her own. "... escuchar a mis alumnos hablar kaqchikel en una canción, me emociona. En cada canción yo incluyo temas nuevos, enseñar el idioma no tiene que ser aburrido." [I get excited by hearing my students speaking the language while singing a song. In every song I add new topics, teaching a language doesn't have to be boring.] She has learned that when students come to class thinking negatively about the process of learning a new language based on previous experiences, teachers must show a positive attitude towards learning; that why she is here to help and guide them throughout her very creative class environment.

"Aprendí Kaqchikel en mi casa, y recuerdo que perdí primero primaria, pero ahora sé que el problema fue que tenía una maestra ladina y únicamente hablaba español, y yo no lo sabía, pero ese año me sirvió mucho para aprender el idioma español y continuar los siguientes grados de educación primaria." [I learned Kaqchikel at home, and I remember that I didn't pass first grade; now I know that one the problems was that

the teacher was a Spanish speaker (Ladina) and she only spoke Spanish in class, and I didn't know the language, and that school year was for me a way to learn Spanish and continue with my further studies.] Even she failed first grade, she used failure as an opportunity to reflect on her Spanish language acquisition.

The use of technology in the classroom

Similar to Elda and Blanca, Reyna agreed to have basic computer skills and knowledge of the use of some online applications. “Gracias a las oportunidades de intercambios académicos en el extranjero, he aprendido y he conocido más sobre la tecnología.” [Thanks to the opportunities I had had to participate in different academic exchanges abroad, I have learned, and I have known more about technology.]

She complained that there are a lot of resources online to learn and practice English, but it is not enough Kaqchikel Mayan language to learn it and practice it by using emerging technologies. However, she uses PowerPoint presentations and videos to teach Mayan culture in her classes. She has also received formal training to use technology and it was sponsored by the Humanities Faculty, similar to what the other instructors have mentioned.

“Yo creo que la generación de mis estudiantes se siente motivados con el uso de la tecnología, yo les he dicho que muchas veces la tecnología nos ha traído ventajas y desventajas.” [I believe that my students generation are motivated for using technology, I have told them that technology has advantages and disadvantages.] I asked her what she wanted to say with that, and she explained the disadvantages,

“Mis estudiantes son hábiles en el uso de los dispositivos móviles, aunque muchas veces, ellos se distraen, se ponen a chatear o lo usan para otras cosas fuera de la clase.” [My students are proficient in the use of mobile devices, although, they get distracted, by chatting, or using it for other things and not for educational purpose.]

“Los estudiantes se benefician, pero el factor tiempo no me deja utilizarla.” [The technology benefits students, but the lack of time doesn’t let me use it.] She indicated that it is hard for her to bring her own computer to class, and the audiovisual room that provides technological tools didn’t have enough technology for every teacher.

She also mentioned that she doesn’t see a difference in the learning process when using technology in the classroom, and it will depend on the teacher. “El maestro debe equilibrar el uso de la tecnología y el uso del pizarrón; si se utilizan correctamente las herramientas tradicionales, el estudiante aprende.” [Teachers must balance the use of technology and the use of the board; if the traditional tools are used correctly, the student learns.] I asked her to expand her own definition about the “traditional tools” to teach and she mentioned the whiteboard, posters and notebooks. Reyna had to teach in different schools besides the university classes she was teaching when the interview was conducted, therefore, she doesn’t have enough time to explore and integrate technology in her classes.

Final Comments

1. How do the professors use technology while teaching IDI3 Mayan Language in the Faculty of Humanities at the Universidad de San Carlos de Guatemala?

The three instructors are literate in the use of technology to teach Mayan language, but they use it to present culture and other theory topics with a PowerPoint presentation.

They feel left behind by not having the skills to use new technologies to teach languages. The instructors encountered challenges and difficulties with the use of technology. For example, they struggle with the lack of time to use technology as part of their classes, and lack of technology in their educational department. Therefore, they are asking for someone else to help them specifically in the use of technology and prepare digital class material they can access online.

These findings showed me to believe that teachers technology will help teachers have more material to teach the language. Technology will benefit students in different ways, especially to be motivated to learn the language, as Reyna and Elda mentioned.

The three instructors can help students improve their participation, language skills development, and group work by having collaborative work as part of their assignments when using technology. On the other hand, Blanca and Reyna believe that the traditional school system is useful to teach a language, however, technology can be useful and distracting to students at the same time.

Whereas Elda mentioned that she is actively using the technology, she has changed her classroom experience in a Mayan language course with her students by

incorporating the WhatsApp application a tool to share information of the course, pronunciation exercises and other activities. The WhatsApp app helps teacher create a group to share pictures, files, audio notes as well. I could also observe that students in the three classes used their cellphone to check information online.

Providing the specific technology to learn a language, teachers will easily use them to improve their classes. The Humanities Faculty's main building has WIFI service for students and teachers, then technological projects can be feasible.

2. In what ways do indigenous language speaker professors describe their experience of teaching their language and culture to Spanish language speakers at the Universidad de San Carlos de Guatemala?

All the participants mentioned how happy and excited they were to teach their mother tongue in post-secondary education level. Their classes are genuinely attached to the Mayan culture heritage, and the three of them wear their traditional dress when teaching the language. Because of their professional work and high standards the two major languages spoken in Guatemala were being taught in the Humanities Faculty in Universidad de San Carlos.

Elda, Blanca, and Reyna agreed that teaching the language is bringing the culture, values and cosmovision of their Mayan community. Students were encouraged to learn a Mayan language and they liked the experience of having a Mayan language course as part of their curriculum. The students actively participate in class. However, it can be a challenge to share culture and language differences to Spanish speakers when they don't have a lot of time to teach the language as the other international languages are taught.

Elda and Blanca acknowledge that teaching they were teaching language in memory of those in their family who struggled in the past to keep the language alive, remembering their grandparents and parents who always encouraged them to keep on using their Mayan language. Reyna also believed that her mission in life was to teach her mother tongue to the new generation of students.

The Academia de Lenguas Mayas de Guatemala ALMG is the main institution where Elda and Reyna have acquired the skills to teach a Mayan language with a Mayan approach. Blanca, on the other hand, became a Mayan language educator of K'iche' at the Centro de Aprendizaje de Lenguas CALUSAC. Those two institutions are important in Guatemala to help Mayan communities for teaching and preserving their languages.

Finally, the three professors mentioned the request they would like to ask to change the name of the course from Idi3 Vernacular Language to Idi3 Mayan Language.

3. In what ways do students engage with the use of technology for the purpose of acquiring language skills in the Mayan language as a third language?

The three teachers believed that by using technology in the classroom might result in increasing students' motivation. However, they found challenging to use technology in the classroom, because students could be distracted in other sites. This idea was evident in the answer of two professors. Even students are good at using new technologies, they believed that is teachers responsibility balance the use of traditional resources and the integration of the technology.

The professor participating in this study believed that their traditional pedagogy would not change. They would still use the board and other physical resource to teach

and have a face-face classroom experience. Therefore, two professors agreed that new technologies that are emerging to learn a language can help them improve their teaching methodologies, however, the lack of online resources in Mayan language and lack of time to include technology when teaching a Mayan language was seen as obstacles.

I believe that with specific training of class management and the use of technology in the classroom, these professors would be ready to balance the technology use in class. Teachers got overwhelming with technology students are using outside the classroom, because they don't know about it. Elda's students were motivated to practice the language when she used it in the classroom.

CHAPTER 5: CONCLUSIONS

Implications

I intend in this chapter to share what the findings indicate about the Mayan languages being taught in higher education in Guatemala. The importance of the indigenous professors teaching their own language (Kaqchikel and K'iche') to Spanish speakers. It is also shared the perception of the Mayan language instructors of how the use of technology in the classroom increases student motivation when technology in the classroom is being, and what activities were popular to engage students into a Mayan language acquisition class. Also, I want to share how an indigenous languages in the in higher education are being taught and the use of technology by the professors as a teaching tool and the access they have at university to create digital material for Mayan language courses, and the formal training and support the professors will need to use technology efficiently.

This study helps educators interested in indigenous languages know more about the teaching of a Mayan language in post-secondary education; in Guatemala, San Carlos University is the only public higher education institution and one of its policies is to include Mayan languages in educational programs. Consequently, since 2009, the Humanities Faculty implemented an educational policy to introduce the teaching of the Mayan language to undergrad students pursuing a degree in Pedagogy and educational administration.

If the Humanities Faculty provided workshops of how to use technology in the classroom and online educative platform as Moodle, new technologies focused on teaching languages should be offered to the professors who are teaching Mayan languages because the study showed that teachers are literate in the use of technology and senior under graduate students could focus their graduation project to prepare different workshop plans for Mayan educators.

The participant professors suggested the change of the name of the class, from Idi3 Vernacular Language to Idi3 Mayan Language (Kaqchikel or K'iche') to be more specific about the language students learn, and this will help revitalize the language heritage by its name. The Evaluation Department and the Pedagogy department in the Humanities Faculty should action to change that in the curriculum.

Teaching a Mayan language meant a lot to the instructors, it should be good to promote the participation of the professors based on their experience as indigenous teachers at the university setting in conferences related to indigenous languages and language acquisition. By creating spaces and give them voice and participation of the educational system in San Carlos University.

It is important to discuss and evaluate the creation of digital portfolios in the Mayan languages by including audio, videos, and images to be used in different classrooms at the Universidad de San Carlos. It should be possible to create such tools by asking Mayan language speaker students and teaches to help organize the topics and vocabulary to be included.

It could be also be part of a teacher's development program for language teachers. Language teachers sharing their own methodologies in a panel, it would be a good chance of teachers who are involved in teaching languages to share their experiences and methodologies with one another.

Fishman and Dede (2016) mentioned that infrastructure, the lack of teacher preparation programs that includes the correct use of technology in the classroom, and the traditional educational system are challenging the transformation of the education when thinking to integrate technology to support teachers and students; technology integration gives the key to open the doors of education opportunities and make better usage of the resources schools offer. The goals by investing in technology infrastructure are to prepare today's students with knowledge and skills that were not necessary in the past, this skills will focus teaching on participatory, collaborative, and guided learning; the ability to help students identify problems and be able to develop solutions paths; it will change the role of the teachers by designing students centered classrooms experiences, including digital videos, and offer online discussions. Teachers need to think that they will alter their practices as their students they are teaching are also changing.

“The whole educational system and teachers (including, teachers preparation programs) need to change their methods as their students are also changing” (Fishman & Dede 2016).

The professors in this study also agreed that it is hard to find a way that teachers be heard and supported to get into a regular teacher preparation program that teaches how to integrate technology in their classes when the right now it is not important for the authorities.

Another suggestion would be to teach the professor the TPACK framework. Koehler and Mishra (2009) defines Technological Pedagogical Content Knowledge as a technology integration framework that identifies three types of knowledge instructors need to combine for successful educational technology integration. It was developed to describe the set of expertise that teachers need to teach their students a specific subject, communicate, and use technology effectively.

TPACK objective is the interaction between them, and the connections between them, so that way, four bases of knowledge can be included when teaching with technology: PCK- knowing how to use teaching approaches to teach a specific content, TPK- knowing the range of technologies accessible and what technologies are suitable to include in a lesson. TCK- understanding how content can be improved or augmented by the addition of technology. The use of this framework will allow teachers to reevaluate what they need to teach effectively by adding technology in their area of expertise. It will help teachers to enhance their lesson planning and to understand the use of emerging technologies and how they can include them into the curriculum to help students learn.

For further research, first, it can be focused on the importance of women education and the impact of revitalizing their mother tongue when indigenous women have access to education, and second, the replication of this projects focused on the other minorities languages spoken in Guatemala such as Garifuna language and the Xinca language as well.

Limitations of the study

The limitations of this research were that the research was contextualized, its results was not generalized to other settings. The findings of the research are only applicable in this specific class program at the Humanities Faculty, Universidad de San Carlos. Also, there are some details the professors didn't mention that may affect the results of the study. Therefore, the results of the research only concern a specific context. During the data collection, there were technology limitations and teachers schedules that affected the flow in the interviews.

Another limitation was the frame to do the research. It took more time than the one that was being scheduled, I needed to travel to Guatemala to collect the data. The use of two languages to collect the data also took more time to translate and organize the topics. Furthermore, the information that is collected it is important and updated to discuss the use of technology to teach Mayan languages in Guatemala in a college level.

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APPENDIX A

Interview Protocol	
How Do professors use technology while teaching IDI3 Mayan Language in the Faculty of Humanities at the Universidad de San Carlos de Guatemala?	
Participant	Date & Place of the interview
Interviewer's Name	Interview Duration
<p>Introduction: The objective of the interview is to know how Mayan Indigenous Educators use technology instruction in their classrooms. I really want to thank you for your participation in this study to describe their experience of teaching a Mayan language and culture to Spanish language speakers at the Universidad de San Carlos de Guatemala.</p> <p>Characteristics:</p> <p>During this interview, you will be asked to tell about your language teaching experience in Kaqchikel Mayan Language programs. I'm also interested in your experience using technology to teach Kaqchikel Mayan Language. There will be not right or wrong answers. All the information provided is confidential and it will be used only for this study. With your permission, I would record our conversation today.</p>	
1. Can you share with me about your educational background?	
¿Podría contarme un poco de su formación docente?	
2. Could you tell me when you started teaching IDI3 Kaqchikel Mayan Language?	
¿Puede comentarme cuando inició a impartir IDI3 Idioma Vernáculo Kaqchikel?	
3. How would you describe your current job as a Mayan Language educator?	
¿Podría describirme su trabajo actual como docente del IDI3 Idioma Vernáculo?	
4. How would you describe your work with the students pursuing a Pedagogy and Educational Administration degree in FAHUSAC?	
¿Como describiría su trabajo con los estudiantes de la Licenciatura de Pedagogía y Administración educativa en FAHUSAC?	
5. What encourages you to work as a Kaqchikel language educator for Spanish	

speakers?
¿Cuál es su motivación en la enseñanza del idioma kaqchikel a estudiantes que hablan español?
6. Are there any obstacles in terms of becoming a Kaqchikel language educator for undergrad students at FAHUSAC?
¿Existe algún obstáculo en la enseñanza del idioma vernáculo a nivel universitario?
7. Can you share one of your favorite moments teaching Kaqchikel at FAHUSAC to Spanish speakers persuading a bachelor's degree in education? What happened? Please explain.
¿Podría compartirme uno de sus mejores momentos como maestra del idioma vernáculo en la Facultad de Humanidades? ¿Qué sucedió? Puede explicarme.
8. Can you share one of your least favorite moments teaching Kaqchikel at FAHUSAC to Spanish speakers persuading a bachelor's degree in education? What happened? Please explain.
¿Podría compartirme uno de los momentos poco agradables que haya vivido durante la enseñanza del idioma vernáculo en la Facultad de Humanidades?
9. How would you describe your background in technology?
¿Cómo describiría su preparación en el uso de la tecnología?
10. How competent are you with using computers to teach Kaqchikel to the students from the San Carlos University, FAHUSAC? If you didn't receive any training, could you describe how have you learned to use the computer or technology?
¿Cuánta práctica tiene en el uso de la computadora para la enseñanza del idioma Kaqchikel a estudiantes de la Facultad de Humanidades? Si usted no ha recibido ningún entrenamiento, ¿podría contarme como ha aprendido a usar la computadora o herramientas de tecnología?

11. How do you use technology in the presentation of your classes?
¿Cómo utiliza la tecnología en la presentación de sus clases?
12. What are the student's benefits when you use technology in the classroom? How motivate do you see your students when using technology?
¿Cómo se benefician los estudiantes cuando se utiliza tecnología en la clase? ¿Puede mencionar si ve a sus estudiantes motivados?
13. What limitations do you have to use technology in the classroom to teach Kaqchikel?
¿Qué obstáculos tiene para usar tecnología en la clase cuando enseña el idioma Kaqchikel?
14. What are the differences you find about the class using technology and the ones you have without using technology?
¿Qué diferencia puede mencionar entre una clase usando tecnología y otra donde no se usa la tecnología?

APPENDIX B**OBSERVATION**

Setting: Universidad de San Carlos de Guatemala, Facultad de Humanidades

Level: Senior Class majoring Pedagogy and Educational Administration

Observation: First observation

Observer Involvement: Participant observation

Date: June 25, 2018.

Place: Room 101 Humanities Faculty, IDI 3

Duration of Observation: 1 hr. (4:00-5:00 p.m.)

Population: Total of 25 students.

APPENDIX C

Participants

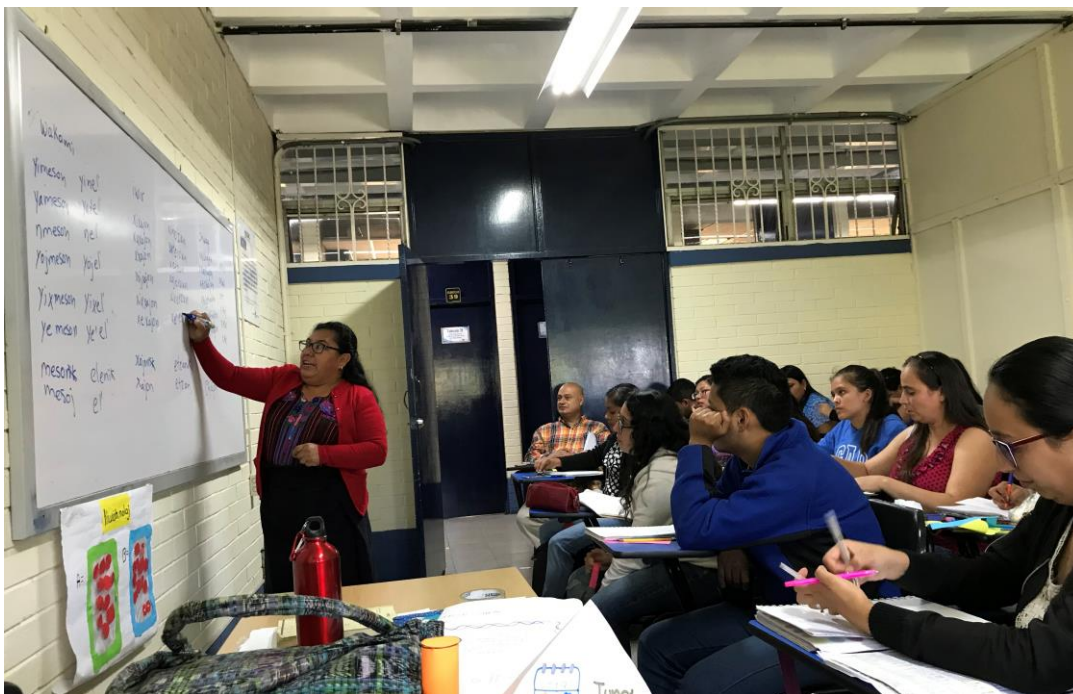


Figure 4. Reyna Siquinaja, one of the participants of this study.




Figure 5. Blanca Estela, one of the participants of this study, and her students.



Figure 6. Elda Marroquín, one of the participants of the study among Elmer Valle and Regina Blanco who helped Hector with the interview by using technology.

APPENDIX D

Letter from the Universidad de San Carlos de Guatemala to Hector Palala requesting him to conduct a research study on indigenous languages education and technology.



USAC
TRICENTENARIA
Universidad de San Carlos de Guatemala

Universidad de San Carlos de Guatemala
Facultad de Humanidades

Guatemala, March 13, 2019

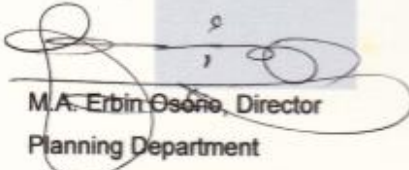
To whom it May concern:

This is to certify that Mr. Hector De Jesus Palala Martinez student at the University of Nebraska-Lincoln pursuing a Master's in Education and Technology has been requested to participate in the research of the use of technology while teaching IDI3 Mayan Language in de Faculty of Humanities at the Universidad de San Carlos de Guatemala. With the results of this research will show the need of improving the curriculum development in the field of Mayan languages.


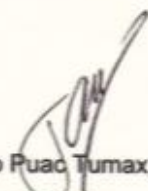
In order for us to know about your decision of leading this research, it is important you send us a confirmation letter and the guidelines to follow your study.

This research should greatly benefit students and professors at the Faculty of Humanities.

Sincerely,



M.A. Erbin Osorio, Director
Planning Department

Dr. Francisco Puac Tumax, Director
The Languages Section

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